FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: **31185**

U S APPLICATION NO (IF KNOWN, SEE 37 CFR): **09/762225**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/SE99/01276	**15 July 1999**	**31 July 1998**

TITLE OF INVENTION

A DEVICE FOR AND A METHOD OF DETECTING A DISEASE OF THE UDDER OF AN ANIMAL

APPLICANT(S) FOR DO/EO/US

NELSON, Lennart; SJAUNJA, Lars

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☐ Other items or information:

U.S. APPLICATION NO (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/762225	PCT/SE99/01276	31185

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☒	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	**$1,000.00**
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	**$860.00**
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	**$710.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	**$690.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	**$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$1,000.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$130.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	20 - 20 =	0	x $18.00	**$0.00**	
Independent claims	2 - 3 =	0	x $80.00	**$0.00**	
Multiple Dependent Claims **(check if applicable)**.			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS			=	**$1,130.00**	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable)**.			☐	**$0.00**	
SUBTOTAL			=	**$1,130.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+	**$0.00**	
TOTAL NATIONAL FEE			=	**$1,130.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☐	**$0.00**	
TOTAL FEES ENCLOSED			=	**$1,130.00**	
				Amount to be: refunded	$
				charged	$

☒ A check in the amount of **$1,130.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **19-0522** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Thomas H. Van Hoozer, Reg. No. 32,761
Hovey, Williams, Timmons & Collins

23589
PATENT TRADEMARK OFFICE

SIGNATURE

Thomas H. Van Hoozer
NAME

32,761
REGISTRATION NUMBER

JAN 31, 2001
DATE

Express Mail No. EL 759815795 US
January 31, 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

NELSON, Lennart et al.

U.S. National Phase Application of
International Application Serial No. :
PCT/SE99/01276

International Filing Date: 15 July 1999

A DEVICE FOR AND METHOD OF DETECTING A DISEASE OF THE UDDER OF AN ANIMAL

Assistant Commissioner of Patents
Box PCT
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Please enter the following preliminary amendment prior to examination of this application on the merits:

ABSTRACT

Applicant submits herewith an abstract of the invention retyped on a separate page in conformance with U.S. practice. The abstract is taken from that appearing on the cover of the published international application.

SPECIFICATION

Please amend the specification as follows:

At page 1, line 9, please delete "BACKGROUND OF THE INVENTION AND PRIOR ART" and substitute therefor:

-- BACKGROUND OF THE INVENTION

1. Field of the Invention --.

At page 1, line 28, please insert:

-- 2. Description of the Prior Art --.

CLAIMS

Please amend the claims as follows:

1. (Amended) A device for detecting a disease of the udder of an animal, comprising:

means [(9)] for appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation[,];

means [(6)] arranged to determine a deviation of said parameter of the first teat from a comparison value[,] and;

means [(7)] arranged to display said deviation as an indication of an inflammation of the first teat at least in the case that said deviation exceeds a certain level, [characterized in that]

wherein the determining means [(6)] is arranged to define said comparison value by including the level of said parameter regarding said second teat during said milking operation.

2. (Amended) A device according to claim 1, [characterized in that] wherein the first teat and said second teat form one of a rearward pair of teats of the udder [or] and a forward pair of teats of the udder.

3. (Amended) A device according to [any one of the preceding claims, characterized in that] claim 1, wherein said comparison value includes the level of said parameter of at least one preceding milking operation of said animal.

4. (Amended) A device according to claim 3, [characterized in that] wherein the determining means [(6, 8)] is arranged to consider the time interval between the milking operation and the immediately preceding milking operation of said animal for determining said deviation.

5. (Amended) A device according to [any one of the preceding claims, characterized in that] claim 1, wherein said parameter includes the quantity of milk produced during said milking operation and that the appreciating means [(9)] includes a milk measuring device.

6. (Amended) A device according to claim 5, [characterized in that] wherein the milk measuring device [(9)] includes a flow meter.

7. (Amended) A device according to [any one of the preceding claims, characterized in that] claim 1, wherein said parameter includes the time duration of said milking operation and that the appreciating means includes a time measuring device [(8)].

8. (Amended) A method of detecting a disease of the udder of an animal, comprising the steps of:

appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation;

defining a comparison value by the level of said parameter regarding said second teat during said milking operation;

determining a deviation of said parameter of the first teat from said comparison value; and

indicating an inflammation of the first test at least in the case that said deviation exceeds a certain level.

9. (Amended) A method according to claim 8, comprising the further step of[:] displaying said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level.

10. (Amended) A method according to [any one of claim 8 and 9] claim 8, wherein the first said teat and said second teat form one of a rearward pair of teats of the udder [or] and a forward pair of teats of the udder.

11. (Amended) A method according to [any one of claims 8 to 10] claim 8, wherein said comparison value includes the level of said parameter of at least one preceding milking operation of said animal.

12. (Amended) A method according to claim 11, comprising the further step of[:] considering the time interval between said milking operation and the nearest preceding milking operation of said animal when determining said deviation.

13. (Amended) A method according to [any one of claims 8 to 12] claim 8, wherein said appreciating step includes measuring the quantity of milk extracted from the actual teat during said milking operation.

14. (Amended) A method according to [any one of claims 8 to 13] claim 8, wherein said appreciating step includes measuring the time duration of one milking operation of the actual teat.

Please add the following new claims:

15. A device according to claim 1, wherein said comparison valve includes the level of said parameter of at least one preceding milking operation of said animal.

16. A device according to claim 15, wherein said parameter includes the quantity of milk produced during said milking operation and that the appreciating means includes a milk measuring device.

17. A device according to claim 16, wherein said parameter includes the time duration of said milking operation and that the appreciating means includes a time measuring device.

18. A method according to claim 9, wherein said first teat and said second teat form one of a rearward pair of teats of the udder and a forward pair of teats of the udder.

19. A method according to claim 18, wherein said comparison valve includes the level of said parameter of at least one preceding milking operation of said animal.

20. A method according to claim 19, wherein said appreciating step includes measuring the time duration of one milking operation of the actual teat.

REMARKS

Applicant submits herewith a Preliminary Amendment for entry prior to computation of the fee and examination of the application on the merits. Applicant believes the amendment submitted herewith conform the application to U.S. practice and it is believed that the amendment to the claims places them in allowable form. Should the examiner have any questions which may

be resolved by telephone conference, it is requested that the examiner contact applicant's attorney at 1-800-445-3460. Should this amendment necessitate any additional fees it may be charged to Deposit Account No. 19-0522.

Respectfully submitted,

HOVEY, WILLIAMS, TIMMONS & COLLINS

By _____

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(Docket No. 31185)

ABSTRACT

The invention refers to a device for and a method of detecting a disease of the udder of an animal. The device comprises means [(9)] for appreciating a parameter related to the quantity of milk extracted from a first and at least a second teat of said animal during at least one milking operation. Means [(6)] is arranged to determine a deviation of said parameter from a comparison value, and means [(7)] is arranged to display said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level. The determining means is arranged to define said comparison value by including the level of said parameter regarding said second teat during said milking operation.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
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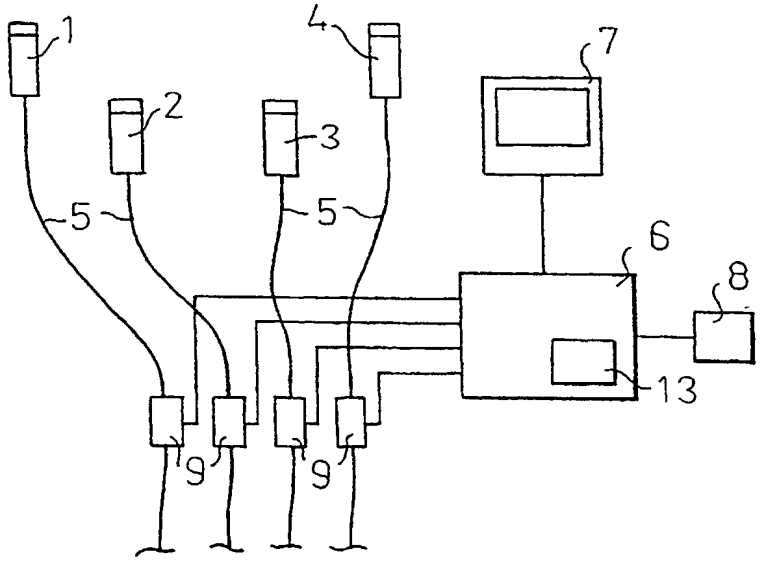

(57) Abstract

The invention refers to a device for and a method of detecting a disease of the udder of an animal. The device comprises means (9) for appreciating a parameter related to the quantity of milk extracted from a first and at least a second teat of said animal during at least one milking operation. Means (6) is arranged to determine a deviation of said parameter from a comparison value, and means (7) is arranged to display said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level. The determining means is arranged to define said comparison value by including the level of said parameter regarding said second teat during said milking operation.

2/PRTS 09/762225
JC02 Rec'd PCT/PTO 30 JAN 2001
PCT/SE99/01276

A device for and a method of detecting a disease of the udder of an animal

BACKGROUND OF THE INVENTION AND PRIOR ART

The present invention refers to a device for detecting a disease of the udder of an animal, comprising means for appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation, means arranged to determine a deviation of said parameter of the first teat from a comparison value, and means arranged to display said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level. Moreover, the invention refers to a method of detecting a disease of the udder of an animal.

The present invention is concerned with udder inflammation of animals, i.e. mastitis, which may be caused by an infection of microorganisms, such as bacteria, but also be the result of a trauma or hormonal imbalances. In all milk production, mastitis constitutes a significant problem with respect to animal comfort, increased workload, reduced production capacity, etc.

In the past, different methods and devices have been proposed for identifying mastitis. Such methods and devices include, for instance, conductivity and temperature measurements on the milk extracted. Such measurements require a rather complicated equipment and the result thereof is still not very reliable. It is also known to identify mastitis by means of laboratory tests, which although reliable is rather inconvenient, since it might take many days before the result of such a test is received by the farmer.

Furthermore, it is known that one part of the udder of a cow, i.e. a quarter of the udder, may be inflamed by mastitis whereas the other quarters thereof are still healthy. Consequently, it is important to be able to identify any inflammation on an individual teat basis, i.e. for each quarter udder.

US-A-4 325 028 discloses one example of a device for measuring the conductivity of the milk from each individual teat in a milk conduit between the teatcup and the claw in order to identify mastitis. The measurement equipment comprises a receiving device, provided in each such milk conduit and having electrodes located therein, and an electronic evaluation device. The constructions of the receiving devices are not described more closely. The aim of the device disclosed is to enable the determination whether the conductivity value of the milk from an individual teat is abnormal and thus whether any udder part is inflamed.

EP-B-137 367 discloses a milking device comprising measurement equipment for detecting the milk flow from an individual teat. The value detected may be employed for determining when the milking from this teat is to be interrupted. The measurement equipment comprises two electrodes for each milk flow to be detected.

US-A-5 116 119 discloses an apparatus for measuring the milk flow through a flow channel. By means of electromagnetic radiation, the momentary volume and the momentary velocity of the milk flowing through the channel may be determined. Consequently, it is possible to determine the milk quantity of each milking operation.

JP-A-5 317 343 discloses a device for diagnosing mastitis. The quantity of milk from each udder part of a cow is measured during one milking operation. The relation between the milk quantity from each udder part and the total quantity is calculated. If the

calculated relation deviates from the previously calculated relation by at least a pre-set value it is determined that the udder part in question is suffering from mastitis.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a device and a method for detecting a disease, in particular an inflammation, of an individual teat in a simple and reliable manner.

This object is obtained by the device initially defined and characterized in that the determining means is arranged to define said comparison value by including the level of said parameter regarding said second teat during the milking operation. It has appeared that a deviation in the quantity of milk produced by a teat in relation to a normal quantity may indicate mastitis in the udder and the particular teat from which the milk has been extracted. Consequently, by making use of this knowledge it is possible to detect mastitis in an easy and convenient manner and thereby take appropriate measures at an early stage to prevent the disease from infecting further udder parts or animals. It has been found that if the milk quantity of one udder part deviates from the milk quantity of an other udder part of one animal, there is high probability that the udder deviating is infected by mastitis. The quantity of milk from one udder normally forms a certain percentage of the total milk quantity from the udder. Any deviation, especially reduction, of said percentage may indicate mastitis in the actual teat or udder part. Moreover, the first teat and said second teat may form one of a rearward pair of teats of the udder or a forward pair of teats of the udder. The milk yield from corresponding udder parts, e.g. from the two rear udder parts, is normally essentially equal whereas the milk yield from the rear udder parts is normally greater than the milk yield from the forward udder parts. Trials have shown that the difference in milk yield from a healthy udder part and an inflamed corresponding udder part might be 23%. By comparing corresponding udder parts in this

manner, no historical data regarding previous milking operations are necessary for the indication of mastitis. Moreover, normal variations in the milk yield need not be considered according to this embodiment. The comparison value may be based on one single second teat or on two or three second teats, for instance, forming an average value of the remaining second teats.

According to a further embodiment of the present invention, said comparison value includes the level of said parameter of at least one preceding milking operation of said animal. It is also possible to compare, for instance, the milk yield from different milking operations of one and the same teat or udder part. By collecting such historical data over a longer period of time, it is possible to determine a normal average parameter regarding the milk yield, which then may be included in the comparison value. Preferably, the determining means is arranged to consider the time interval between the milking operation and the immediately preceding milking operation of said animal for determining said deviation. For instance, in voluntary milking systems, the time interval between successive milking operations may vary. In order to obtain a comparable value of said parameter, it is advantageous to take account of this time interval.

According to a further embodiment of the present invention, said parameter includes the quantity of milk produced during said milking operation and the appreciating means comprises a milk measuring device. In such a manner, a milk meter or any other liquid measuring device, such as any kind of liquid flow meter, may be employed for each teat or udder part for determining said parameter.

According to a further embodiment of the present invention, said parameter includes the time duration of said milking operation and the appreciating means includes a time measuring device. It is appreciated that the duration of the milking operation of one teat or udder part reflects the quantity of milk obtained during this milking

operation. Consequently, by comparing the time duration of, for instance, the milking operation of two corresponding udder parts or between two successive milking operations of one teat or udder part, it is possible in an easy and convenient manner to detect an inflammation of an udder part.

The above object is also obtained by the method initially defined and comprising the steps of:
appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation,
defining a comparison value by including the level of said parameter regarding said second teat during said milking operation,
determining a deviation of said parameter of the first teat from said comparison value, and
indicating an inflammation of the first teat in the case that said deviation exceeds a certain level.

Advantageous embodiments of the method are defined in the dependent claims 9 to 14.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described more closely by means of various embodiments and with reference to the accompanying drawings, in which

Fig 1 shows a schematic view of a device according to the present invention, and
Fig 2 shows a part of a device according to the present invention.

DETAILED DESCRIPTION OF VARIOUS EMBODIMENTS OF THE PRESENT INVENTION

Fig 1 discloses a device for indicating mastitis in any of the teats or udder parts of an animal. The device according to the invention is connected to a milking machine, which may be of a conventional type and which is merely represented in the drawings by four teatcups 1, 2, 3 and 4 and four milk conduits 5 connecting each teatcup 1-4 to a milk-receiving member of the milking machine.

In the following it is referred to milking of a respective teat. However, by this expression is meant milking of a respective udder part, i.e. one of the two rear udder parts or one of the two front udder parts. As an example, the teatcups 1, 4 may be intended for milking of the front udder parts whereas the teatcups 2, 3 are intended for milking of the rear udder parts.

The device comprises a processing unit 6 provided to determine a deviation in a parameter related to the quantity of milk extracted from any of the four teats from a comparison value. The processing unit 6 is connected to or incorporates a display member 7. The display member 7 may be of a number of different types. For instance a screen, a number of indicating lamps or diodes, one for each teat, producing a light signal when a teat is inflamed, or any display disclosing the size of the deviation leaving to the farmer to conclude if the deviation indicates an inflammation or not. Furthermore, the processing unit 6 may be connected to or incorporate a time measuring unit 8 arranged to measure the duration of a milking operation of a teat and/or the time period between two successive milking operations of a teat.

Furthermore, the device according to the invention comprises appreciating means 9, one for each teatcup 1-4. The construction and function of the appreciating means 9 may vary according to different embodiments of the present invention. Fig 2 discloses an appreciating means 9 in the form of a milk measuring device

comprising a container 10 arranged to collect the milk produced during one milking operation. The milk measuring device comprises a sensor 11 arranged to sense the quantity of milk collected during the milking operation and transfer the sensed quantity to the processing unit 6. When the processing unit 6 has registered the milk quantity, a valve 12 is opened in order to convey the milk collected to the milk-receiving member of the milking machine. It is to be noted that also other types of milk measuring devices may be employed when realising the present invention, for instance the liquid measuring device disclosed in US-A-5 116 119.

The appreciating means 9 may also be realised by a device merely arranged to indicate whether there is a milk flow or not. Such a device is for instance disclosed in EP-B-137 367 mentioned above. Thereby the time measuring unit 8 may be arranged to measure the duration of the milking period, i.e. the time interval from the beginning of the milk flow through the conduit 5 until the end of the milk flow. It is appreciated that the duration of the milking operation reflects the quantity of milk produced during said milking operation, i.e. the interval appreciated forms said parameter.

According to an embodiment, the processing unit 6 is arranged to compare said parameter related to the quantity of milk from the two front teatcups 1, 4 or from the two rear teatcups 2, 3. In this case no time measuring unit 8 is necessary. Merely the fact that the quantity of milk form one of the front teats or the rear teats deviates from the other front teat and rear teat, respectively, is an indication that the actual teat may be inflamed by mastitis.

According to another embodiment, the processing unit 6 is arranged to compare said parameter between the actual milking operation and at least one previous milking operation. A deviation in quantity in the actual milking operation is an indication that the teat may be inflamed by mastitis. In this embodiment the processing unit 6 comprises a memory 13 arranged to store

historical data regarding said parameter of one or more previous milking operations for each teat. Preferably, an average value of said parameter of a great number of previous milking operations may be calculated by means of the processing unit 6. This average value may then be stored in the memory 13 and included in said comparison value.

It is to be noted that the comparison value is based on the parameter of another teat during one milking operation but historical data from one or several preceding milking operations may also be considered, as a supplementary information, when defining the comparison value in order to reduce any source of error.

It is also possible to define said parameter as the quantity of milk produced during a determined period of time by one teat of an animal, for instance during 24 hours, or by the total duration of milking during a determined period of time, i.e. the total time period when milk is actually flowing from a teat during 24 hours.

The present invention is not limited to the embodiments described above but may be varied and modified within the scope of the following claims.

Claims

1. A device for detecting a disease of the udder of an animal, comprising means (9) for appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation, means (6) arranged to determine a deviation of said parameter of the first teat from a comparison value, and means (7) arranged to display said deviation as an indication of an inflammation of the first teat at least in the case that said deviation exceeds a certain level, characterized in that the determining means (6) is arranged to define said comparison value by including the level of said parameter regarding said second teat during said milking operation.

2. A device according to claim 1, characterized in that the first teat and said second teat form one of a rearward pair of teats of the udder or a forward pair of teats of the udder.

3. A device according to any one of the preceding claims, characterized in that said comparison value includes the level of said parameter of at least one preceding milking operation of said animal.

4. A device according to claim 3, characterized in that the determining means (6, 8) is arranged to consider the time interval between the milking operation and the immediately preceding milking operation of said animal for determining said deviation.

5. A device according to any one of the preceding claims, characterized in that said parameter includes the quantity of milk produced during said milking operation and that the appreciating means (9) includes a milk measuring device.

6. A device according to claim 5, characterized in that the milk measuring device (9) includes a flow meter.

7. A device according to any one of the preceding claims, characterized in that said parameter includes the time duration of said milking operation and that the appreciating means includes a time measuring device (8).

8. A method of detecting a disease of the udder of an animal, comprising the steps of:
appreciating a parameter related to the quantity of milk extracted from a first teat and at least a second teat of said animal during at least one milking operation,
defining a comparison value by the level of said parameter regarding said second teat during said milking operation,
determining a deviation of said parameter of the first teat from said comparison value, and
indicating an inflammation of the first teat at least in the case that said deviation exceeds a certain level.

9. A method according to claim 8, comprising the further step of:
displaying said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level.

10. A method according to any of claim 8 and 9, wherein the first said teat and said second teat form one of a rearward pair of teats of the udder or a forward pair of teats of the udder.

11. A method according to any one of claims 8 to 10, wherein said comparison value includes the level of said parameter of at least one preceding milking operation of said animal.

12. A method according to claim 11, comprising the step of:
considering the time interval between said milking operation and the nearest preceding milking operation of said animal when determining said deviation.

13. A method according to any one of claims 8 to 12, wherein said appreciating step includes measuring the quantity of milk extracted from the actual teat during said milking operation.

14. A method according to any one of claims 8 to 13, wherein said appreciating step includes measuring the time duration of one milking operation of the actual teat.

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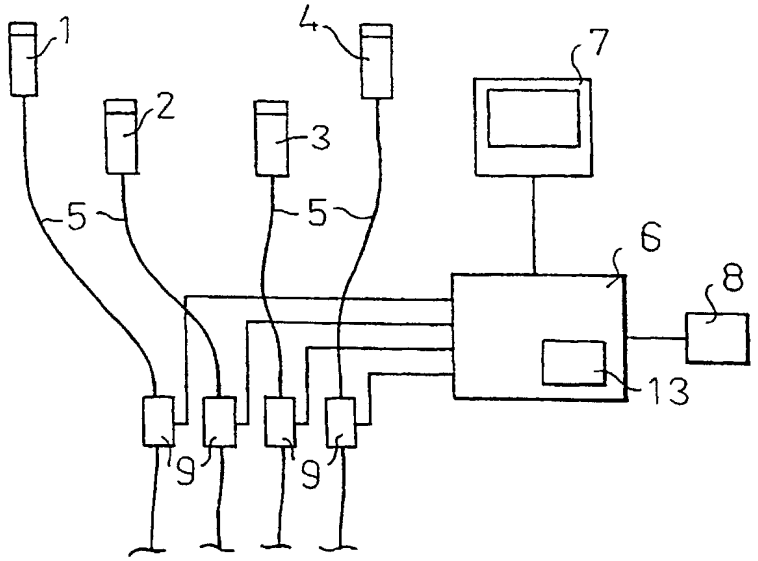


(57) Abstract

The invention refers to a device for and a method of detecting a disease of the udder of an animal. The device comprises means (9) for appreciating a parameter related to the quantity of milk extracted from a first and at least a second teat of said animal during at least one milking operation. Means (6) is arranged to determine a deviation of said parameter from a comparison value, and means (7) is arranged to display said deviation as an indication of an inflammation of the first teat in the case that said deviation exceeds a certain level. The determining means is arranged to define said comparison value by including the level of said parameter regarding said second teat during said milking operation.

Fig 1

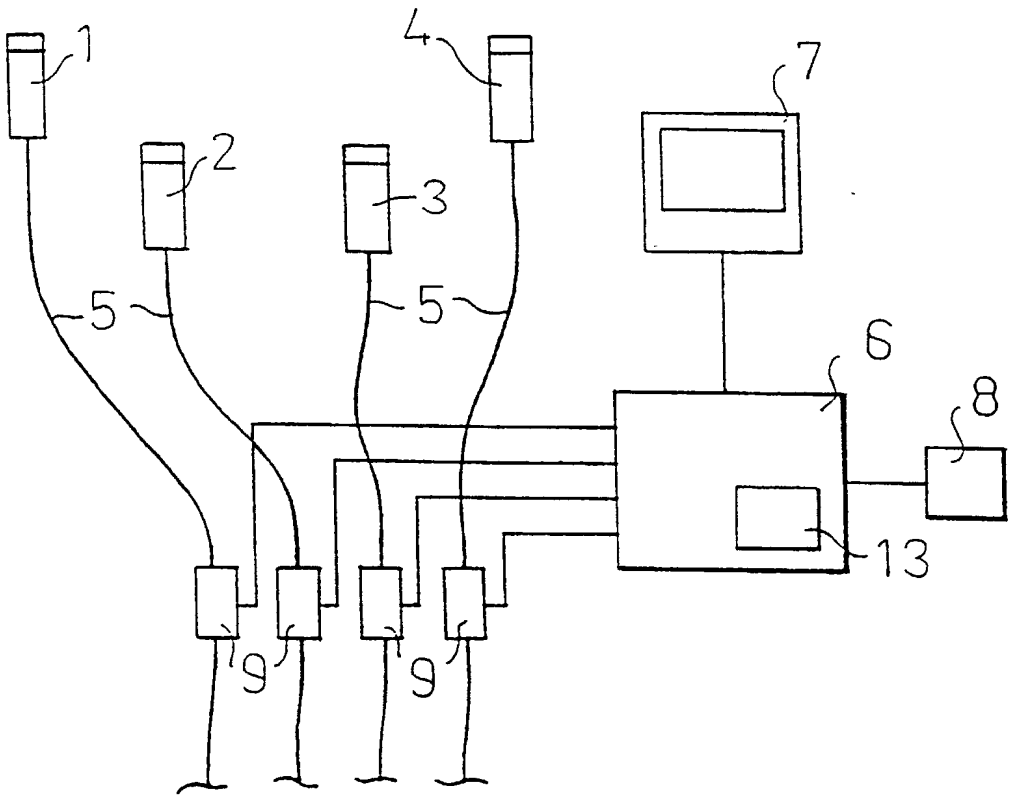
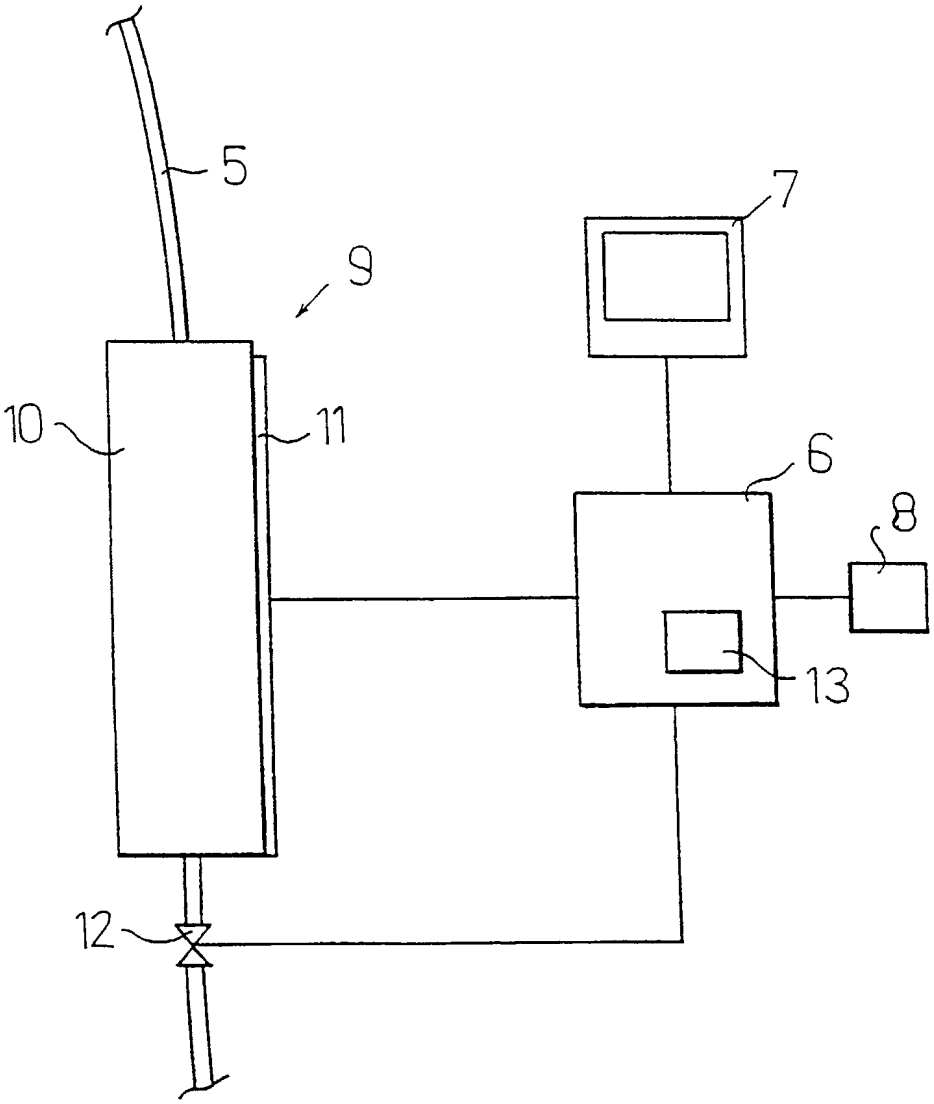


Fig 2



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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A DEVICE FOR AND A METHOD OF DETECTING A DISEASE OF THE UDDER OF AN ANIMAL

the specification of which (check only one item below):

[ ] is attached hereto.

[ ] was filed as United States application.
Serial No. _____
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I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

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DATE 29/3 2001	DATE 29 march 2001	DATE